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Tivoli Impact Assessment Report

White Paper

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1. Introduction

Tivoli COTS product version 3.6.2 is required by the ECS Baseline and deployed to all Data Active Archive Centers (DAACs). Goddard Space Flight Center (GSFC) is the only DAAC using it to monitor and manage its system resources, but has now requested to not upgrade to Tivoli version 3.7. The National Snow and Ice (NSIDC), Langley (LaRC) and Land Data Processing (LP DAAC) DAACs have provided a Non-conformance Report (NCR) requesting deviation from the ECS Baseline. Based on DAAC usage and maintenance cost to the ECS project, keeping Tivoli as part of the ECS baseline needs to be considered.

1.1 Purpose

The purpose of this analysis is to assess the impact of the DAACs' decision to not upgrade and install Tivoli version 3.7. The DAACs are currently monitoring and managing their system environment very successfully without the use of Tivoli. In addition, this assessment report will provide a recommendation to ESDIS on whether the functionality provided by WhatsUp Gold, Whazzup, DAAC Unique Extensions and Unix scripts can replace Tivoli.

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2. Tivoli General Information

Tivoli Enterprise is an open highly scalable suite of management applications that is designed to manage large enterprise systems and distributed systems. The complete Tivoli Enterprise product suite consists of three components: the framework, applications, and toolkits. The Tivoli Management Framework is the foundation for other Tivoli Enterprise and third-party management products. It provides a graphical desktop, object-oriented database, and base service used by other products.

Presently, ECS is supporting Tivoli Management Framework 3.6.3. Tivoli Management Applications is a suite of applications that is installed on top of the Tivoli Management Framework. The ECS baseline contains the following Tivoli Management Applications: Tivoli Software Distribution 3.6.2 which provides capabilities of software distribution automation, installation, and updates across a network; Tivoli Distributed Monitoring 3.6.2 which monitors system resources and services; and Tivoli Enterprise Console 3.6.2 which collects management messages and alarms from a variety of sources and performs automatic responses. The above ECS Baselined Tivoli applications are Sun Solaris 8.0 compatible.

2.1 Justification for Tivoli Upgrade to Version 3.7

The ECS Baseline has been upgraded to support Sybase Adaptive Server (ASE) 12.5. Tivoli Management Framework 3.6.3 is not certified to run with Sybase Adaptive Server (ASE) 12.5. Tivoli Management Framework 3.6.3 reached it's end of life on July 31 2002 therefore upgrade to version 3.7 is required. The current ECS plan is to deliver Tivoli for all hosts at the DAACs and SMC, even though some sites may not install it.

2.2 Current Use of Tivoli Enterprise at the Goddard DAAC

Tivoli is a sophisticated tool that is relatively complex to install and maintain. The DAACs found it hard to install and cumbersome to use, Only Goddard DAAC (GDAAC) is using it regularly. The other DAACs, including Goddard DAAC, have relied on using their own DAAC Unique Extensions or Unix scripts to manage their system environment and monitor their DAAC system performance.

The Goddard DAAC uses Tivoli, and would like to keep it in their ECS Baseline at version 3.6.3. GDAAC uses Tivoli to monitor Network Server, Network Client, monitors, and network collisions. There are several scripts that run on hourly, daily and weekly basis and outputs are written to various logs.

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3. DAACs System Management Tools

Table 3-1 provides a summary of the system management tools being used at the DAACs.

Table 3-1. Summary of System Management Tools

Tool	ECS Baselined	GDAAC	NDAAC	LDAAC	LP DAAC
Tivoli	X	X			
WhatsUp Gold	X	X		X	X
Whazzup	X	X		X	X
MRTG		X		X	X
DaemonWatch				X	
SNIPS			X		
DUEs (Customized Scripts)		X		X	X
Customized System Activity Report (SAR)					X

3.1 Goddard Space Flight Center (GSFC)

The following system management tools are being used at Goddard. These tools are used in addition to Tivoli Management Framework 3.6.3. Some of the tools are considered DUEs and are not part of the ECS Baseline.

3.1.1 WhatsUp Gold

WhatsUp Gold is a PC based network administrative tool that provides network device identification, network mapping, network performance, network device monitoring, log manager, and graphical displaying capabilities. It supports both SNMP and TCP/UDP, and allows for report automation, import/export utility, and a customizable web-based user interface. WhatsUp Gold also monitors the ECS custom code. Cost, rapid implementation, and ease of use appear to be its strong points. This tool is part of the ECS Baseline.

3.1.2 MRTG

The Multi Router Traffic Grapher (MRTG) is a tool used to monitor the traffic load on network-links. MRTG generates HTML pages containing PNG images, which provide a LIVE visual representation of network traffic.

MRTG works on most UNIX platforms and Windows NT. MRTG consists of a Perl script, which uses SNMP to read the traffic counters of routers and a fast C program, which logs the

traffic data and creates graphs representing the traffic on the monitored network connection. These graphs are embedded into web pages, which can be viewed from any Web-browser.

In addition to a detailed daily view, MRTG also creates visual representations of the traffic seen during the last seven days, the last five weeks and the last twelve months. This is possible because MRTG keeps a log of all the data it has pulled from the router. This log is automatically consolidated, so that it does not grow over time, but still contains all the relevant data for all the traffic seen over the last two years. All this is performed in an efficient manner. Therefore, it is possible to monitor 200 or more network links from any sufficient UNIX box.

MRTG is not limited to monitoring traffic. It is possible to select any SNMP variable for monitoring. External programs can be used to gather the data to should be monitored. MRTG is being used to monitor things such as system load, login sessions, and modem availability, plus additional items. MRTG supports the accumulation two of more data sources into a single graph. This tool is not part of the ECS Baseline.

3.1.2.1 Highlights of MRTG

MRTG is written in Perl and comes with full source.

3.1.2.2 Portable SNMP

MRTG uses a highly portable SNMP implementation written entirely in Perl. There is no need to install any external SNMP package.

3.1.2.3 SNMPv2c Support

MRTG can read the new SNMPv2c 64bit counters. No more counter wrapping occurs now.

3.1.2.4 Reliable Interface Identification

Router interfaces can be identified by IP address, Description and Ethernet address in addition to the normal Interface number.

3.1.2.5 Constant size Log files

MRTG's log files do not grow, but remain constant in size, this is due to the use of a unique data consolidation algorithm.

3.1.2.6 Automatic Configuration

MRTG comes with a set of configuration tools, which make configuration and setup very simple.

3.1.2.7 Performance

Time critical routines are written in C.

3.1.2.8 GIF free Graphics

Graphics are generated directly in PNG format, using the GD library.

3.1.2.9 Customizability

The look of the web pages produced by MRTG is highly configurable.

3.1.2.10 RRDtool

MRTG has built in hooks for using RRDtool. This tool can be used for monitoring.

3.1.3 Customized Unix Scripts

Customized Unix scripts have been developed to support the system management activities at Goddard DAAC. These scripts were developed by system administrators and perform a variety of functions. The scripts enable the system administrator to: monitor system host level for fault detection, receive email notification about the system host level faults, monitor HIPPI interfaces, monitor network communication equipment, monitor Remedy Server, Autosys Server, Sybase Server, SQS Server, Science Processors for percentage of disk space used, monitor Network Server, monitor Network Client, monitor several performance parameters such as disk space, disk IO, average load, number of processors, and monitor available swap space, and MSS agents and subagents. These scripts are run on an hourly, daily and weekly basis and outputs are written to various logs.

3.2 National Snow and Ice Data Center (NSIDC)

The following system management tools are presently being used at NSIDC.

3.2.1 SNIPS (System & Network Integrated Polling Software)

SNIPS is a complete package for monitoring networks or Unix systems. It can generate alarms based on thresholds, graph monitored data using RRDtool (MRTG style) and, generally, offer all the functions that you would expect from a monitoring package. It is being used in large ISP networks to monitor as many as 1500+ devices. The most popular SNIPS monitors are for TCP ports, ICMP (ippingmon), RPC (rpcpingmon), Unix systems (hostmon), and SNMP variables (snmpmon). New monitors can be added easily (via a C or Perl API).

3.3 Langley Research Center (LaRC)

The following system management tools are presently being used at LaRC.

3.3.1 WhatsUp Gold

See Section 3.1.1.

3.3.2 DaemonWatch

DaemonWatch is a client/server application designed to monitor the ECS registry, name server, polling processes, and subsystem servers. The application is written in TCL/Tk and utilizes multiple Bourne (SH) and Korn (KSH) shell scripts that interact with intrinsic operating system and third party applications. When activated, DaemonWatch displays a graphical user interface (GUI) that provides immediate feedback on the status of the servers and services being monitored

3.3.2.1 Functionality

DaemonWatch is divided into two distinct and separate components: the client side GUI, and the server side information gathering mechanism. The client-side GUI is the component by which the user interacts with the various physical servers to start, stop, and monitor the custom code registry, name, polling processes, and subsystems. The server-side information gathering mechanism is the other component. It is generally hidden from view and requires no user interaction.

Client-Side GUI:

The client-side GUI may be executed on any recognized server listed in the DaemonWatch configuration file (systems.cfg). When the client-side GUI is activated, communications between it and any other recognized server-side daemon is achieved. The communications consist of a request initiated by the client that is sent to one or more servers that have been selected for monitoring.

Example: A user wants to check the status of a server. The communication between the client and server is as follows.

Client -> Server: **ALV:**

Server -> Client: **YES**

Upon receipt of the "YES" string, the client-side responds by color-coding the button associated with a particular subsystem or polling process. The underlying program, that performs the test to determine if a given process is up or down is a shell script that executes a "ps" command (processes listing) on the server. If the name of the subsystem or polling process is found in the process listing, the daemon returns the appropriate string to the requesting client. This same communication is used to test if the physical servers are responding similar to the way "ping" works.

Server-Side Daemon:

The server-side daemon operates in the background. It remains idle and listens on port **55777** for DaemonWatch version 4.00 and port **58830** for DaemonWatch version 6.00. The port is defined in the main startup script, "DaemonWatch". When a client-side request is received, the server-side daemon evaluates the request string and performs one of a series of predefined functions on a particular server. When the server has finished processing the command, the output from the

command, if any, is then returned by the server-side daemon to the client-side GUI, where it is displayed.

3.3.2.2 Customized Unix Scripts

The Langley DAAC is using custom scripts that were developed by system administrators. These script and perform a variety of system monitoring functions.

3.3.3 Land Processing Data Center (LP DAAC)

The following system management tools are presently being used at LP DAAC.

3.3.3.1 WhatsUp Gold

See Section 3.1.1.

3.3.3.2 Whazzup

Whazzup is a tool that monitors and displays the execution status and related performance statistics associated with ECS programs. It is implemented using the Perl language and uses a CGI-based web interface to display information to the user.

3.3.3.3 MRTG

See Section 3.1.2.

3.3.3.4 Customized System Activity Report (SAR Scripts)

LP DAAC uses System Activity Report (SAR) scripts to support the some of the management activities. The scripts were developed by system administrators and perform a variety of functions. The scripts enable the system administrator to: monitor system host level for fault detection and receive email notification about the system host level faults. These scripts are run an on hourly, daily and weekly basis and outputs are written to various logs.

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4. Tivoli Requirements

Table 4-1 provides the requirements that were identified as being fully or partially satisfied at by Tivoli at EOC. These requirements are also mapped to the system management tools actually being used at the DAACs. It should be noted that a number of these requirements were primarily satisfied by the ECS code and criteria citing Tivoli were a minor factor, e.g., ESN-0690, DADS1360.

Table 4-1. Mapping of Tivoli Requirements to System Management Tools at the DAACs (1 of 9)

(Noted: WhatsUp Gold and Whazzup are included in the ECS Baseline)					
L3 ID	**L3 Text**	**GDAAC**	**NDAAC**	**LDAAC**	**LP DAAC**
DADS1300	The ECS shall display all faults to the system operators.	WhatsUp Gold, Whazzup	SNIPS	DaemonWatch, WhatsUp Gold, Whazzup, Unix Scripts	WhatsUp Gold, Whazzup
DADS1320	The ECS shall provide fault isolation information at the system and subsystem levels.	WhatsUp Gold, Whazzup, Unix Scripts	SNIPS	DaemonWatch, WhatsUp Gold, Whazzup, Unix Scripts	WhatsUp Gold, Whazzup, Unix Scripts
DADS1330	The ECS shall provide information to support fault isolation between ECS-unique components and external interfaces.	WhatsUp Gold, Whazzup, Unix Scripts	SNIPS	DaemonWatch, WhatsUp Gold, Whazzup, MRTG, Unix Scripts	WhatsUp Gold, Whazzup, Unix Scripts
DADS1360	The ECS shall monitor the status and performance of all storage systems used.	WhatsUp Gold, Unix Scripts	SNIPS	DaemonWatch, WhatsUp Gold, Whazzup, Unix Scripts	WhatsUp Gold, Whazzup, Unix Scripts, SAR
DADS1380	The ECS shall monitor data transfer between external (non-ECS) elements and the ECS.	WhatsUp Gold, Unix Scripts	SNIPS	DaemonWatch, WhatsUp Gold, Whazzup, MRTG, Unix Scripts	WhatsUp Gold, Whazzup, Unix Scripts, SAR, MRTG
DADS1390	The ECS shall monitor data transfer between components of the ECS.	WhatsUp Gold, Unix Scripts	SNIPS	DaemonWatch, WhatsUp Gold, Whazzup, MRTG, Unix Scripts	WhatsUp Gold, Whazzup, Unix Scripts, SAR, MRTG
DADS1470	The ECS shall manage element resource utilization.	WhatsUp Gold, Whazzup, MRTG	SNIPS	DaemonWatch, WhatsUp Gold, Whazzup, MRTG, Unix Scripts	WhatsUp Gold, Whazzup, MRTG, Resource Log

Table 4-1. Mapping of Tivoli Requirements to System Management Tools at the DAACs (2 of 9)

(Noted: WhatsUp Gold and Whazzup are included in the ECS Baseline)					
L3 ID	**L3 Text**	**GDAAC**	**NDAAC**	**LDAAC**	**LP DAAC**
EOSD0780	The ECS shall be capable of being monitored during testing.	WhatsUp Gold, Whazzup, MRTG, Unix Scripts	SNIPS	DaemonWatch, WhatsUp Gold, Whazzup, MRTG, Unix Scripts	WhatsUp Gold, Whazzup, MRTG, Unix Scripts
EOSD1703	The ECS shall provide maintenance and operations interfaces to the DAACs to support the functions of: a. System Management b. Science Algorithm Integration c. Product Generation d. Data Archive/Distribution e. User Support Services f. System Maintenance	WhatsUp Gold Unix Scripts	SNIPS	DaemonWatch, WhatsUp Gold, Whazzup, MRTG, Unix Scripts	WhatsUp Gold, Whazzup, MRTG, Unix Scripts
EOSD4100	The ECS network segments and components shall include the on-line (operational mode) and off-line (test mode) fault detection and isolation capabilities required to achieve the specified operational availability requirements.	Unix Scripts, WhatsUp Gold	SNIPS	WhatsUp Gold, MRTG, Unix Scripts	WhatsUp Gold, Whazzup, MRTG
ESN-0620	The ECS shall include a network management function to monitor and control the local ECS networks.	Unix Scripts, WhatsUp Gold, MRTG	SNIPS	WhatsUp Gold, MRTG, Unix Scripts	WhatsUp Gold, MRTG
ESN-0640	The ECS shall include management functions at each ECS site, for the management of ECS network equipment or gateways.	WhatsUp Gold, MRTG	SNIPS	WhatsUp Gold, MRTG, Unix Scripts	WhatsUp Gold, MRTG

Table 4-1. Mapping of Tivoli Requirements to System Management Tools at the DAACs (3 of 9)

(Noted: WhatsUp Gold and Whazzup are included in the ECS Baseline)					
L3 ID	**L3 Text**	**GDAAC**	**NDAAC**	**LDAAC**	**LP DAAC**
ESN-0650	The ECS shall perform the following network management functions for each protocol stack implemented in any ECS element, and each communications facility: a. Network Configuration Management b. Network Fault Management c. Network Performance Management	WhatsUp Gold, MRTG, Unix Scripts	SNIPS	WhatsUp Gold, MRTG, Unix Scripts	WhatsUp Gold, MRTG, Network Sniffer
ESN-0690	The ECS shall be capable of reconfiguration transparent to network users.	WhatsUp Gold, Unix Scripts	SNIPS	WhatsUp Gold, MRTG, Unix Scripts	WhatsUp Gold, Unix Scripts
ESN-0740	The ECS network management service shall retrieve performance/fault data about local ECS network protocol stacks and equipment.	WhatsUp Gold, MRTG, Unix Scripts	SNIPS	WhatsUp Gold, MRTG, Unix Scripts	WhatsUp Gold, MRTG, Unix Scripts, Network Sniffer
ESN-0750	The ECS network management component at each DAAC shall provide capabilities for the extraction, tabulation, and display to the operator of network performance data.	WhatsUp Gold, MRTG	SNIPS	WhatsUp Gold, MRTG, Unix Scripts	WhatsUp Gold, MRTG
ESN-0760	The ECS network management function at each DAAC shall provide, on an interactive basis, network configuration, fault and performance information.	WhatsUp Gold, MRTG	SNIPS	WhatsUp Gold, MRTG, Unix Scripts	WhatsUp Gold, MRTG

Table 4-1. Mapping of Tivoli Requirements to System Management Tools at the DAACs (4 of 9)

(Noted: WhatsUp Gold and Whazzup are included in the ECS Baseline)					
L3 ID	**L3 Text**	**GDAAC**	**NDAAC**	**LDAAC**	**LP DAAC**
ESN-0780	The ECS network elements, shall have the capability to report, periodically and on an interactive basis, network statistics to the ECS network management function, including the following information: a. Network reset and restart indications b. Outages	WhatsUp Gold, Unix Scripts	SNIPS	WhatsUp Gold, MRTG, Unix Scripts	WhatsUp Gold, Operations Downtime Log
ESN-0790	The ECS shall include the following configuration management functions: a. Collect information describing the state of the network subsystem and its communications resources, b. Exercise control over the configuration, parameters, and resources of the sub	WhatsUp Gold, MRTG, Unix Scripts	SNIPS	WhatsUp Gold, Whazzup, MRTG, Unix Scripts	WhatsUp Gold, MRTG, Unix Scripts
ESN-0800	The ECS shall be capable of displaying the local network configuration status related to each system locally, and for all systems at the SMC.	WhatsUp Gold, Unix Scripts	NA	NA	NA
ESN-0810	The ECS shall provide the following fault management functions: a. Detect the occurrence of faults, and b. Control the collection of fault information	WhatsUp Gold, MRTG, Unix Scripts	SNIPS	DaemonWatch, WhatsUp Gold, Whazzup, MRTG, Unix Scripts	WhatsUp Gold, Whazzup, MRTG, Unix Scripts

Table 4-1. Mapping of Tivoli Requirements to System Management Tools at the DAACs (5 of 9)

(Noted: WhatsUp Gold and Whazzup are included in the ECS Baseline)					
L3 ID	**L3 Text**	**GDAAC**	**NDAAC**	**LDAAC**	**LP DAAC**
ESN-0830	The ECS shall have the capability to detect and report communications related errors and events.	WhatsUp Gold, Whazzup, MRTG, Unix Scripts	SNIPS	DaemonWatch, WhatsUp Gold, Whazzup, MRTG, Unix Scripts	WhatsUp Gold, Whazzup, MRTG, Unix Scripts
ESN-0840	The ECS shall have communications error reporting, event logging and generation of alerts.	WhatsUp Gold, Whazzup, MRTG, Unix Scripts	SNIPS	DaemonWatch, WhatsUp Gold, Whazzup, MRTG, Unix Scripts	WhatsUp Gold, Whazzup, MRTG, Unix Scripts
ESN-0900	The ECS shall detect the following errors and events: a. Communications hardware errors b. Protocol errors c. Performance degradation conditions d. Telecommunications errors and failures	WhatsUp Gold, Whazzup, Unix Scripts	SNIPS	DaemonWatch, WhatsUp Gold, Whazzup, MRTG, Unix Scripts	WhatsUp Gold, Whazzup, MRTG, Unix Scripts
ESN-0910	The ECS communications fault management shall provide the capability to perform the following functions both locally and at the SMC: a. Set, view, and change alert threshold values b. Enable and disable alert notifications (alarms) within a system c. Enab	WhatsUp Gold, Unix Scripts	NA	NA	NA
ESN-0920	The ECS shall provide a set of utilities to perform diagnostic and testing functions for purposes of communications fault isolation.	Unix Scripts, WhatsUp Gold	SNIPS	DaemonWatch, WhatsUp Gold, Whazzup, MRTG, Unix Scripts	Unix Scripts, WhatsUp Gold

Table 4-1. Mapping of Tivoli Requirements to System Management Tools at the DAACs (6 of 9)

(Noted: WhatsUp Gold and Whazzup are included in the ECS Baseline)					
L3 ID	**L3 Text**	**GDAAC**	**NDAAC**	**LDAAC**	**LP DAAC**
ESN-1000	The ECS network management function shall have the capability to build histories for different types of errors and events, and the capability to analyze errors and recommend corrective action wherever practical.	WhatsUp Gold, MRTG, Unix Scripts	SNIPS	WhatsUp Gold, , MRTG, Unix Scripts	WhatsUp Gold, MRTG, Unix Scripts
ESN-1060	The ECS network performance management function shall provide the capability to evaluate the performance of ECS networks resources and interconnection activities.	WhatsUp Gold, MRTG, Unix Scripts	SNIPS	WhatsUp Gold, MRTG, Unix Scripts	WhatsUp Gold, MRTG, Unix Scripts
ESN-1070	The ECS shall provide the capability to perform the following functions: a. Generate/collect network statistics b. Control collection/generation of network statistics	WhatsUp Gold, MRTG, Unix Scripts	SNIPS	WhatsUp Gold, MRTG, Unix Scripts	WhatsUp Gold, MRTG, Unix Scripts
ESN-1090	The ECS shall provide the capability to control the communications performance parameters of the network.	WhatsUp Gold, MRTG, Unix Scripts	SNIPS	WhatsUp Gold, MRTG, Unix Scripts	WhatsUp Gold, MRTG, Unix Scripts
IMS-1650	The ECS operations data shall contain information on: a. System utilization b. Outstanding data distribution requests c. Outstanding processing requests	WhatsUp Gold, Whazzup, Unix Scripts	SNIPS	DaemonWatch, WhatsUp Gold, Whazzup, MRTG, Unix Scripts	Operations Status Reports, WhatsUp Gold, Whazzup, Unix Scripts
IMS-1760	The ECS shall raise the following detected hardware faults: a. Processors b. Network interfaces c. Storage devices	WhatsUp Gold, MRTG, Unix Scripts	SNIPS	DaemonWatch, WhatsUp Gold, Whazzup, MRTG, Unix Scripts	WhatsUp Gold, Whazzup, MRTG, Unix Scripts

Table 4-1. Mapping of Tivoli Requirements to System Management Tools at the DAACs (7 of 9)

(Noted: WhatsUp Gold and Whazzup are included in the ECS Baseline)					
L3 ID	**L3 Text**	**GDAAC**	**NDAAC**	**LDAAC**	**LP DAAC**
PGS-0420	The ECS shall provide tools to analyze system performance.	Unix Scripts, WhatsUp Gold, MRTG	SNIPS	WhatsUp Gold, , MRTG, Unix Scripts	MRTG, SAR, Unix Scripts, WhatsUp Gold, SAR
SMC-0340	The ECS shall provide notification of system faults within 5 minutes of their detection.	WhatsUp Gold, Unix Scripts,	SNIPS	WhatsUp Gold, MRTG, Whazzup, Unix Scripts	WhatsUp Gold, Unix Scripts Resource Log, Phone
SMC-3300	The ECS shall monitor site hardware status to determine operational states including: a. On-lines b. Off-line (e.g., failed, off for maintenance)	WhatsUp Gold, MRTG, Whazzup, Unix Scripts	SNIPS	DaemonWatch, WhatsUp Gold, Whazzup, MRTG, Unix Scripts	WhatsUp Gold, MRTG, Whazzup, Unix Scripts
SMC-3370	For each performance parameter, the ECS shall have the capability of establishing and evaluating multiple thresholds to include, as applicable:a. On/offb. Pass/failc. Various levels of degradation	WhatsUp Gold, Whazzup, MRTG, Unix Scripts	SNIPS	DaemonWatch, WhatsUp Gold, Whazzup, MRTG, Unix Scripts	WhatsUp Gold, MRTG, Whazzup, Unix Scripts
SMC-3380	The ECS shall evaluate the overall system performance including the analysis of EBnet related fault and performance information and their long-term trend analysis to determine the impact to ECS system.	WhatsUp Gold, Unix Scripts	SNIPS	WhatsUp Gold, MRTG, Unix Scripts	WhatsUp Gold, Unix Scripts, .SAR

Table 4-1. Mapping of Tivoli Requirements to System Management Tools at the DAACs (8 of 9)

(Noted: WhatsUp Gold and Whazzup are included in the ECS Baseline)					
L3 ID	**L3 Text**	**GDAAC**	**NDAAC**	**LDAAC**	**LP DAAC**
SMC-3390	The ECS shall generate alert indicators of fault or degraded conditions.	WhatsUp Gold, Whazzup, MRTG Unix Scripts	SNIPS	DaemonWatch, WhatsUp Gold, Whazzup, MRTG, Unix Scripts	WhatsUp Gold, Whazzup, MRTG Unix Scripts
SMC-3410	The ECS shall provide tools to perform short and long-term trend analysis of system and site performance to include: a. Operational status b. Performance of a particular resource c. Maintenance activities (e.g., number of repairs per item)	WhatsUp Gold, Whazzup, MRTG, Unix Scripts	SNIPS	DaemonWatch, WhatsUp Gold, Whazzup, MRTG, Unix Scripts	WhatsUp Gold, Whazzup, MRTG Unix Scripts
SMC-3420	The ECS shall provide tools to perform short and long term trend analysis of system landsite performance to determine the impact on resources of: a. Modifying system, site, or element activity allocations b. Potential enhancements to system, site, or element	WhatsUp Gold, Whazzup, MRTG, Unix Scripts	SNIPS	DaemonWatch, DaemonWatch, WhatsUp Gold, Whazzup, MRTG, Unix Scripts	WhatsUp Gold, Whazzup, MRTG Unix Scripts
SMC-4310	The ECS shall support fault analysis including: a. Isolation b. Location c. Identification d. Characterization	WhatsUp Gold, Whazzup, MRTG, Unix Scripts	SNIPS	DaemonWatch, WhatsUp Gold, Whazzup, MRTG, Unix Scripts	WhatsUp Gold, Whazzup, MRTG Unix Scripts

Table 4-1. Mapping of Tivoli Requirements to System Management Tools at the DAACs (9 of 9)

(Noted: WhatsUp Gold and Whazzup are included in the ECS Baseline)					
L3 ID	**L3 Text**	**GDAAC**	**NDAAC**	**LDAAC**	**LP DAAC**
SMC-4311	The ECS shall support fault analysis to the level of: a. Software processes b. Equipment	WhatsUp Gold, Whazzup, MRTG, Unix Scripts	SNIPS	DaemonWatch, WhatsUp Gold, Whazzup, MRTG, Unix Scripts	WhatsUp Gold, Whazzup, MRTG Unix Scripts
SMC-4330	The ECS shall have the capability to send fault recovery commands, directives, and instructions to ECS components except for faults directly related to flight operations.	WhatsUp Gold, Unix Scripts	SNIPS	DaemonWatch, WhatsUp Gold, Whazzup, MRTG, Unix Scripts	Custom Code GUI's.

5. Tivoli Maintenance Cost

The annual maintenance cost associated with Tivoli Systems Management modules from the ECS baseline is $16,450. This includes bug fixes and any upgrades.

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6. Recommendation

The ECS recommendation is that Tivoli not be upgraded to version 3.7. Tivoli Management Framework 3.6.3, that is presently installed at Goddard DAAC, should not continue to have maintenance support. Lastly, the Tivoli product should be removed from the ECS Baseline via CCR process.

The following factors contributed to this recommendation.

1. An assessment of The DAACs and SMC system management needs.
2. An evaluation of the current installation of Tivoli and how it is presently being used.
3. DAAC submittal of Non-conformance Reports (NCRs) requesting deviation from the ECS Baseline (GSFC-ECSed35990, NSIDC-ECSed31806/ECSed36388 LaRC-ECSed31681, EDC-ECSed31593).

In summary, although Tivoli is a sophisticated tool, it is relatively complex to install and maintain, so most DAACs are no longer using it. The Goddard DAAC is the only DAAC using it, all the DAACs actually rely on their own DAAC Unique Extensions or Customized Unix scripts to manage their system environment and monitor their DAAC system performance. The number of users cannot justify retaining the Tivoli product in the ECS Baseline. Should concurrence be reached on removing Tivoli from the ECS Baseline, the project would avoid future annual maintenance costs associated with the project, at a savings of $16,450 per year.

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7. Baseline Deviation DAAC NCRs

This section provides a copy of the NCRs, which document each of the DAACs plan regarding the implementation of Tivoli.

7.1 GSFC/SMC NCR: ECSed35990

NCR ID: ECSed35990 Status: ASSIGNED-EVAL Submitted: 021112

NCR Class: OPERATIONS Project: OPS_BLdeviation Enclosures: 1

NCR TITLE. **GSFC/SMC: M&O CCR 02-0849 TRelease of Tivoli 3.7.x to the D**

PROBLEM INFORMATION...

Build Name[*]: Drop 6A.06

Test Site[*]: GSFC DAAC

Detection Method[*]: Customer Use

Detected-In-Phase[*]: DAAC Activity

Test Case ID:

Machine Name:

Severity (1=Showstopper)[*]: 2

Priority: 000 Priority Date:

High Priority: 000 Mode [*]:

Trouble Ticket: SMC000000005091

DAAC Trouble Ticket: GSF000000008100

Submitter: rgray

ANALYSIS INFORMATION...

Evaluate Engineer: evelyn

Assigned To: ksimmons

Analysis Due Date(yymmdd): 030115 Page 1/2

********** Problem (Modified 021112 by ocoates) **********

Long Description :

Problem:

GDAAC will be phasing out Tivoli and CCR 02-0849 will not be implemented. This CCR is filed w/o further notice.

Impact:

Tivoli will no longer be used at GDAAC.

POC - Ron Gray 301-614-5035

<< end of description >>

SUBMITTER INFO:

Submitter Name: Ron Gray

Submitter Phone: 301-614-5035

Submitter Email: rgray@gsfcsrvr4.gsfcmo.ecs.nasa.gov

********** History **********

bugs 1010629 000000 Submitted by Remedy via ddts@eos.hitc.com

xddts 021112 133107 Enclosure "Problem" edited by ocoates

xddts 030110 121354 N -> A (Assign-Eval to ksimmons) by evelyn

xddts 030110 121551 Forwarded from OPS_DAAC to OPS_BLdeviation by evelyn

7.2 EDC NCR: ECSed31593

NCR ID: ECSed31593 Status: ASSIGNED-EVAL Submitted: 010724

NCR Class: OPERATIONS Project: OPS_DAAC Enclosures: 1

NCR TITLE. **Tivoli 3.6.3/3.6.2 deviation at EDC**

PROBLEM INFORMATION...

Build Name[*]: 5B.07

Test Site[*]: EDC DAAC

Detection Method[*]: Customer Use

Detected-In-Phase[*]: DAAC Activity

Test Case ID:

Machine Name:

Severity (1=Showstopper)[*]: 3

Priority: 000 Priority Date:

High Priority: 000 Mode [*]:

Trouble Ticket: SMC000000003647

DAAC Trouble Ticket: EDC000000008473

Submitter: rockvam

ANALYSIS INFORMATION...

Evaluate Engineer: cjones

Assigned To: ggavigan

Analysis Due Date(yymmdd): 020305 Page 1/2

NCR Class: OPERATIONS Project: OPS_DAAC

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********** Problem **********

Long Description EDC does not plan to install Tivoli 3.6.3/3.6.2 which is part of the HP to Sun migration.

We do not use this product, and past attempts to install and configure it have been unsuccessful, so we won't spend the resources on it.

Please forward to OPS_DAAC.

<< end of description >>

SUBMITTER INFO:

Submitter Name: Tamara Rockvam

Submitter Email: rockvam@usgs.gov

Submitter Phone: 605-594-6852

********** History **********

bugs 1010629 000000 Submitted by Remedy via ddts@eos.hitc.com

xddts 010724 123344 enclosure "Problem" edited by ocoates

xddts 020226 155543 N -> A (Assign-Eval to ggavigan) by cjones

7.3 NSIDC NCR ID: ECSed31593

NCR ID: ECSed31806 Status: ASSIGNED-EVAL Submitted: 010813

NCR Class: OPERATIONS Project: OPS_DAAC Enclosures: 1

NCR TITLE **Tivoli 3.6.3/3.6.2 deviation at NSIDC**

PROBLEM INFORMATION...

Build Name[*]: 6A.04

Test Site[*]: NDAAC DAAC

Detection Method[*]: Customer Use

Detected-In-Phase[*]: DAAC Activity

Test Case ID:

Machine Name:

Severity (1=Showstopper)[*]: 3

Priority: 000 Priority Date:

High Priority: 000 Mode [*]:

Trouble Ticket: SMC000000003714

DAAC Trouble Ticket: NSC000000000526

Submitter: gehmeyr

ANALYSIS INFORMATION...

Evaluate Engineer: cjones

Assigned To: ggavigan

Analysis Due Date(yymmdd): 020305

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NCR Class: OPERATIONS Project: OPS_DAAC

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********** Problem **********

Long Description :

NSIDC does not plan to install Tivoli 3.6.3/3.6.2 which is part of the HP to

Sun migration.

We do not use this product, and past attempts to install and configure it have been unsuccessful, so as per today's local CCB we decided not to spend the resources on it.

<< end of description >>

SUBMITTER INFO:

Submitter Name: Michael Gehmeyr

Submitter Phone: 303-492-6742

Submitter Email: gehmeyr@kryos.colorado.edu

********** History **********

bugs 1010629 000000 Submitted by Remedy via ddts@eos.hitc.com

xddts 010813 130542 enclosure "Problem" edited by ocoates

xddts 020226 155303 N -> A (Assign-Eval to ggavigan) by cjones

7.4 NSIDC NCR ID: ECSed36388

NCR ID: ECSed36388 Status: NEW Submitted: 030102

NCR Class: OPERATIONS Project: OPS_DAAC Enclosures: 1

NCR TITLE. **Tivoli-Notice of deviation from baseline**

PROBLEM INFORMATION...

Build Name[*]: Drop 6A.06

Test Site[*]: NSIDC DAAC

Detection Method[*]: Customer Use

Detected-In-Phase[*]: DAAC Activity

Test Case ID:

Machine Name:

Severity (1=Showstopper)[*]: 3

Priority: 000 Priority Date:

High Priority: 000 Mode [*]: OPS

Trouble Ticket: SMC000000005225

DAAC Trouble Ticket: NSC000000000837

Submitter: edmands

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NCR Class: OPERATIONS Project: OPS_DAAC

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********** Problem **********

Long Description :

Tivoli is not installed on our systems because it requires too many resources to support the product. The load it places on the systems is too high as well a

s the personel resources to install and support the installation. There are also limitations on what services Tivoli can monitor.

<< end of description >>

********** History **********

bugs 1010629 000000 Submitted by Remedy via ddts@eos.hitc.com

xddts 030102 104705 Fields modified by ocoates

7.5 Langley NCR ID: ECSed31681

NCR ID: ECSed31681 Status: ASSIGNED-EVAL Submitted: 010731

NCR Class: OPERATIONS Project: OPS_DAAC Enclosures: 1

NCR TITLE: **LaRC does not plan to install Tivoli 3.6.3/3.6.2 which is p**

PROBLEM INFORMATION...

Build Name[*]: 5B.07

Test Site[*]: Langley DAAC

Detection Method[*]: Customer Use

Detected-In-Phase[*]: DAAC Activity

Test Case ID:

Machine Name:

Severity (1=Showstopper)[*]: 3

Priority: 000 Priority Date:

High Priority: 000 Mode [*]:

Trouble Ticket: SMC000000003669

DAAC Trouble Ticket: LRC000000004036

Submitter: andrews

ANALYSIS INFORMATION...

Evaluate Engineer: cjones

Assigned To: ggavigan

Analysis Due Date(yymmdd): 020305 Page 1/2

NCR Class: OPERATIONS Project: OPS_DAAC

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********** Problem **********

Long Description :

LaRC does not plan to install Tivoli 3.6.3/3.6.2 which is part of the HP to Sun

Migration

LaRC does not plan to install Tivoli 3.6.3/3.6.2 which is part of the HP to Su
n Migration. Langley will not use this product.
Please forward to OPS_DAAC.
<< end of description >>

********** History **********

bugs 1010629 000000 Submitted by Remedy via ddts@eos.hitc.com

xddts 020226 155428 N -> A (Assign-Eval to ggavigan) by cjones